

**WHAT IS CLAIMED IS:**

1           1. A call originating service method in a public/private common mobile communication  
2 system, comprising the steps of:

3           determining whether the call origination message is for the public mobile communication  
4 service or the private mobile communication service upon receipt of an origination call message  
5 from a mobile station (MS) through a BTS (Base station Transceiver Subsystem) which provides  
6 both public and private mobile communication services; and

7           transmitting the call origination message to either a public mobile communication network  
8 or a private mobile communication network based on the determination results.

1           2. The call originating service method as claimed in claim 1, wherein the determination step  
2 comprises the steps of:

3           determining whether the mobile station is registered for the private mobile communication  
4 service; and

5           determining whether the mobile station is part of the private mobile communication network.

1           3. A call originating service method in a mobile communication system, the method  
2 comprising the steps of:

3           providing a communication service apparatus which performs public and private mobile  
4 communication services with a private BTS (Base station Transceiver Subsystem) connected to at

5 least one of a plurality of base station controllers (BSCs) belonging to a public mobile  
6 communication system, each of said plurality of BSCs connected to corresponding ones of a plurality  
7 of Mobile Switching Centers (MSC's);

8 determining in the communication service apparatus whether the call origination message  
9 is for the public mobile communication service or the private mobile communication service upon  
10 receipt of a call origination message transmitted from the mobile station through the private BTS;;  
11 and

12 transmitting the call origination message to either a BSC connected to the private BTS or a  
13 private BSC for the private mobile communication service according to the determination results.

1 4. The call originating service method as claimed in claim 3, wherein the determination step  
2 comprises the steps of:

3 determining whether the mobile station is registered for the private mobile communication  
4 service; and

5 determining whether said mobile station is part of said private mobile communication  
6 network.

1 5. A mobile communication system, comprising:

2 a private (Base station Transceiver Subsystem) BTS connected to one a plurality of (Base  
3 Station Controllers) BSCs belonging to a public mobile communication system, said public  
4 communication system comprising a plurality of (mobile switching centers) MSC's, each one of said

5 MCS's connected to a corresponding one of a plurality of BSC's; and

6 a router apparatus for, upon receipt of a call origination message transmitted from the mobile  
7 station through the private BTS, determining whether the call origination message is for the public  
8 mobile communication service or the private mobile communication service, and transmitting the  
9 call origination message to either a BSC connected to the private BTS or a private BSC for the  
10 private mobile communication service according to the determination results.

1 6. The mobile communication system of claim 5, wherein said router apparatus comprises  
2 a call manager that determines whether a call originating from a mobile station is destined to be  
3 handled by a public mobile communication system or a private mobile communication system.

1 7. The mobile communication system of claim 6, said call manager comprising:  
2 a data communications interface for controlling the interface to the call manager;  
3 a private base station controller;  
4 a private visitor location register;  
5 a private base station transceiver subsystem message router for requesting the private visitor  
6 location register whether a mobile station is registered in the private mobile communication service  
7 and transmits a call message to said private base station controller; and  
8 a private mobile switching center for recording on the private visitor location register the  
9 existence of the transmitting call and forms a telephone line if the mobile station responds.

1           8. The method of claim 2, wherein said step of determining whether the mobile station is  
2 registered for the private mobile communication service comprises the step of consulting a visitor  
3 location register (VLR) of a call manager inside a public/private common cell area.

1           9. The method of claim 2, wherein said step of determining whether the mobile station is  
2 registered for the private mobile communication service comprises consulting a visitor location  
3 register (VLR) of a call manager inside a public/private common cell area.

1           10. The method of claim 4, wherein said step of determining whether the mobile station is  
2 registered for the private mobile communication service comprises the step of consulting a visitor  
3 location register (VLR) of a call manager inside a public/private common cell area.

1           11. The method of claim 4, wherein said step of determining whether the mobile station is  
2 registered for the private mobile communication service comprises consulting a visitor location  
3 register (VLR) of a call manager inside a public/private common cell area.

1           12. The method of claim 2, wherein said call is transmitted to a public communications  
2 network if either the mobile station is not registered for private mobile communication service or  
3 the transmitting number is not a private mobile communications network number.

1           13. The method of claim 4, wherein said call is transmitted to a public communications

2 network if either the mobile station is not registered for private mobile communication service or  
3 the transmitting number is not a private mobile communications network number.

1 14. The method of claim 2, wherein said call is handled by said private communications  
2 network only if both said mobile station is registered with said private mobile communication  
3 service and said transmitting number is a private mobile communication network number.

1 15. The method of claim 4, wherein said call is handled by said private communications  
2 network only if both said mobile station is registered with said private mobile communication  
3 service and said transmitting number is a private mobile communication network number.